The Increase of Cancer in England

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Sir Andrew Clark Bt
M.D. etc etc.
with the Author's
compliments

A LETTER TO THE REGISTRAR-GENERAL

ON

THE INCREASE

OF

CANCER

IN ENGLAND

AND ITS CAUSE

BY

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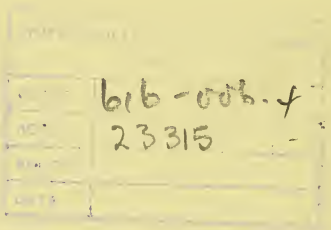


THE INCREASE

OF

CANCER IN ENGLAND.

A Letter to the Registrar General.

My dear Sir Brydges Henniker,

Public interest is at present, owing to circumstances which it is unnecessary to particularize, excited on a medical question — that of Cancer. While this letter was in preparation, one of the leading journals, the *St. James's Gazette* (November 25th, and December 1st, 1887), called attention to the great increase in England in the rate of the mortality caused of late years by this disease. The increase is not only an absolute one in itself, but shows a progressive ratio. In the year 1855 there was one death from Cancer to 70 deaths from all diseases, and one death

from Cancer to 3075 persons living: in 1885 the proportion had risen to one death from Cancer out of 33 deaths from all causes, and one death from this disease in 1767 of the population—a difference of 74 per cent.

Dr. William Ogle, in his able letter in the Supplement to your Forty-fifth Annual Report, p. xiv., has called attention to this fact, and has given an explanation of it which will be examined further on.

At the same time as Cancer was showing this increase, another disease much more prevalent, and which, until within the present generation, was looked upon by the Medical Profession as almost equally fatal—I mean Phthisis or pulmonary Consumption—has shown a corresponding, equally progressive, and much greater decrease. The mortality caused by it in 1855 was *one eighth* of the total deaths, and there was one fatal case for every 354 persons living. In 1885 these figures had fallen to *one eleventh* of the deaths, and one death to 570 persons living—a decrease of 61 per cent.

Without any undue presumption, I think I may claim that this last condition of things is due to my discovery of the cause and the specific cure of Tuberculosis as set forth by me in three papers: first, in a note addressed to the French Academy of Medicine, in Paris, on June 3rd, 1856; again in a paper read before the same society on the 21st of July, 1857, now more than thirty years ago; and lastly, in a third paper, read before the French

Academy of Sciences, in the month of May of the following year.

As I claim to have originated the remedy which has produced this remarkable falling off in the mortality from Phthisis, so also can I say that I discovered and pointed out, for the first time in 1864, twenty-three years ago, and again in 1875, the existence of a causal connection between Phthisis and Cancer: a connection until then unknown, and which, although then established and explained by me, has been, and still is, entirely unnoticed and ignored up to the present day. My object in this letter is to show in what this causal connection consists; to indicate the important bearing which it has upon the Public Mortality, and to show how the decrease of the number of deaths from Consumption has—owing to the backward state of Therapeutics, and the perversion and misuse by speculators and ignorant traders of the Remedy I have discovered—been accompanied by an increase of the number of deaths from Cancer.

My discovery of a remedy for Phthisis, instead of having been employed within the precise, definite, scientific limits which I had assigned to it, instead of having been taken up by the Medical Profession and used according to the strictly ascertained and accurate data which I had laid down, has been allowed to fall into the hands of speculators and unqualified medicine sellers, with the result that while Phthisis has been steadily on the decrease, Cancer, not so wide spread, and as far as the mortality is

concerned (taking matters as they stood before my discovery, thirty years ago), not a more fatal disease, but a more impressive one, because it entails greater suffering, and thus strikes the imagination ; Cancer, I say, has been on the increase. I therefore think it is personally incumbent on me to point out not only the coincidence, and the correlation, but the causal connection between these two series of events, and to show that the present state of things finds a natural and necessary explanation in the facts, upon which I established, for the first time twenty-three years ago, the true etiological, and till then unknown, relation between these two widely different diseases, as you will find by referring to page 758 of my French work, "*De la Cause Immédiate de la Phthisie Pulmonaire et des Maladies Tuberculeuses et de leur traitement Spécifique pour les Hypophosphites d'après les principes de la Médecine Stœchiologique.*" (Deuxième Édition, Paris : Victor Masson et fils, 1864) : and again, more minutely and with greater precision, eleven years later, in my work on "*Consumption, Tuberculosis, and the Hypophosphites.*" (London : Longmans, 1875, pp. 244, 245, 246, and 247.)

If, as I think I shall be able to do, I can settle the scientific groundwork of this question, I believe I shall be calling attention to a very important public matter ; I shall be establishing the truth of a still more important medical doctrine ; and I shall be giving a proof that Medical Science (and for my present purpose I restrict the meaning of the word exclusively

to *the Art of Curing Disease*), that Medicine, I say, is already sometimes, and will ultimately become always, as positively defined, as certain in its results, and as accurate in its anticipations and previsions, as the older and more perfect sciences: Physics and Chemistry. This I shall now proceed to do.

Medicine is a very complex science; and although the fundamental branches of knowledge upon which it rests, Anatomy, Physiology, Pathology, and Clinical Medicine, are, to a certain extent, now established upon scientific data, the last and crowning sequence of all these, Therapeutics, the art of curing disease, is still in an altogether unscientific condition, blown about by every wind of doctrine, and like another art in the same inchoate state, which I need not name, continually subject to alternate fits, fashions, and fads.

Twenty-three years ago, in the year 1864, I explained in detail what I thought was the true basis of Pathology and Therapeutics, founded upon the principles of *Stœchiological Medicine*, and at the same time I laid down what I considered a self-evident method of Therapeutics, which gives the practitioner the means of estimating and settling at all times the value of any mode of treatment in any given disease. This was not a mere speculation, but a scientific conception, which had led me to the discovery of the cause, the remedy, and the *scientific treatment* of Consumption, which I made known in 1857.

If you will refer to my work on "*Consumption and the Hypophosphites*" (London: Longmans, 1875, pp. 1—21), you will find that, in that same year, 1857, according to the unanimous opinion of the leading physicians of England, France, Germany, and the United States, Consumption was looked upon as almost always incurable—and that, out of 428,000 deaths in the year in England, 50,000 were due to Consumption alone. It was then considered "the greatest, the most constant, and the most dreadful of all the diseases that afflict mankind." (*Registrar General's Report for* 1852.) In 1860 it was called "A disease which is the great terror of the country, which has hitherto defied all human skill, and entirely baffled Medical Science" (*H. W. Porter, Paper read before the Institute of Actuaries*).

Starting from the general doctrine I have just alluded to, I found that Consumption and Tuberculosis were due to the deficiency of the *phosphide* principle, the special and characteristic element of the *oxydizable* phosphorus compounds naturally existing in the animal system, and that the remedy consisted in the use of the Hypophosphites, which alone of all the compounds of Phosphorus unite the two necessary requirements of being *assimilable* and *oxydizable*.

Unfortunately, instead of advocating this new mode of treatment in the way generally followed for new remedies, I contended that my discovery was a legitimate deduction from the doctrine just alluded

to, and that it was to be used according to certain definite and precise rules, which I formulated. Instead of merely giving, as is usually done, a mode of treatment with some more or less vague indications for its application, I laid down a hard and fast rule, which was to be followed under pain of failure. Instead of merely following in Therapeutics the *rule of thumb*, the only one generally acted upon, even up to the present day, I declared that the treatment of a case of Consumption admitted of the same definite direction and management as a process in Chemistry, an experiment in Physiology, or an operation in Surgery.

The pretension, that one of the most widely spread, one of the most incurable of all diseases not only could be cured, but that it could *always* be so under certain definite and ascertained conditions, and that the time would come when, by the application of my discovery, Consumption would, like Smallpox and the Itch, be completely stamped out, was, to the medical mind thirty years ago, a very presumptuous assertion. I am afraid I must plead guilty to having done worse still. Not only was Consumption *always* to be cured under *certain ascertained* conditions, but I claimed that this result was arrived at by me, not by observation, then the great Medical Shibboleth ; not by some lucky guess ; but by starting from a strictly scientific hypothesis, founded upon a general principle which itself involved not only an altogether new conception of Pathology, that is, of the nature of

disease, but also a new method in Therapeutics, that is to say, a new departure in the use and application of medicines. So that not only were physicians called upon to accept the curability of Consumption, until then looked upon as an impossibility and as the favourite field of quackery and imposture, but they were required to get rid of a great deal of what they had hitherto admitted, and still admit, concerning the art of treating disease.

I should like to say, in as few words as possible, in what these novel doctrines consist. You will see that they have an important bearing upon the subject of this letter, and I cannot do better than quote the summary of them given in the First Report of my Free Stœchiological Dispensary for the Poor, No. 208, Marylebone Road, which contains the most condensed form in which I have been able to state them. They rest upon this fundamental principle, that as all living beings are built up of certain elements, or chemical compound bodies called *Proximate Principles*, health and disease are dependent upon the changes in these elements. This requires a little explanation ; but, as the explanation might appear at first sight to be an unnecessary digression, I have preferred placing it in an Appendix, which I subjoin.

As I have said above, the hypothesis upon which I had started for the purpose of discovering a cure for Consumption was that this disease depended upon the want or the waste of the *oxydizable* phosphorized

elements in the body, whence it followed that the remedy for it consisted in the use of some *oxydizable* and *assimilable* compound of Phosphorus. Among the compounds of this kind, I selected the Hypophosphites, and I showed that all other compounds of Phosphorus would be inert or dangerous, for reasons which I then fully explained, and which I need not particularize here.

This existence of an *oxydizable* phosphorus compound in the animal system was at the time of commencing my researches quite an unsettled point among chemists. It was admitted by some, and rejected by others, and my experiments were the first attempt to draw any theoretical or practical inference from the *possibility* of its existence. I pointed out that as it would be diffused throughout the system, and be found only in very small quantities in any one spot, it was impossible to decide chemically upon the validity of this hypothesis, upon which, nevertheless, I proceeded to act.

The result, first of my experiments upon animals and upon myself, next of my observations upon my patients, fully bore out, as I considered, the soundness of my views, and in the papers I have mentioned, I made public what these results were. This attracted considerable attention, and the Hypophosphites suddenly came into general use, and gave rise to a great deal of controversy. They were tried according to *the rule of thumb*, *then* and *now* the only one known in Therapeutics: "Use a remedy

as long as it does, or appears to do, good, leave it off as soon as it appears to do harm," and the conclusion was, according to many, that it was a very good remedy ; according to some, a most wonderful one; according to others, perfectly useless. My views met with general acceptance in the United States and on the Continent, and were fully endorsed by a number of eminent physicians, particularly in France, Italy, Belgium, and Spain. Here, in England, the opinions of the profession were not so favourable. Among those first called upon, by their position, to deliver an opinion were the physicians of the Brompton Hospital for Consumption, who condemned my statements altogether. Since then the Hypophosphites have been for many years in use at this Hospital, and the mortality from Consumption treated there fell from 94 per cent., according to their Report, in 1854 to less than 10 per cent., according to their later Report, in 1873. But, although the usefulness of my remedies is thus established, yet in all the latest publications of the Brompton physicians, their value is minimized to the very utmost ; no allusion is made to the former unqualified condemnation of them, and all recognition of their origin, as well as all mention of the name of the discoverer, is carefully suppressed. Other English physicians of at least equal standing and weight with those of the Brompton Hospital have, however, fully adopted my views, as you may see in my book ; but to this day there are many practitioners who have never got

any further than the first condemnatory verdict of the Brompton people, and for whom Consumption is as incurable now as it was thirty years ago.

Meanwhile, time went on, and the Hypophosphites were successively placed :

In the Pharmacopœia of the United States in 1872;

In the Pharmacopœia of Great Britain in 1874 ;

In the Russian Pharmacopœia in 1880 ;

In the French Pharmacopœia in 1884 ;

In a very few years after the publication of my discovery the mortality from Consumption in England began to show a decrease, as set forth in the Registrar-General's Reports. This was first noticed in the year 1866, and was attributed to improved drainage. Four years later, in 1870, a further decrease was again noted, and was then attributed to improved diagnosis. But this explanation was given up. Dr. Farr then said, " Allowing for erroneous diagnosis, does not account for the decrease in the mortality from Phthisis from 3·03, 2·79, and 2·82 per 1,000 in the three years, 1853—1855 ; to 2·40, 2·41, and 2·44 in the last three years (1868, 1869, 1870)."

Two years after, the *Lancet* (May 11, 1872), in a leading article, called particular attention to the same fact. It said : " The treatment of Phthisis " has strikingly improved, and the results are much " more satisfactory than they once were. One " physician after another tells us that in this, its " common form (Consumption), Tubercle is much " more amenable to treatment than it used to be."

It proceeded to call upon Dr. C. J. B. Williams, Senior Physician to the Brompton Hospital, and upon Dr. Henry Bennet, of Mentone, to let the public know more of the possibility of curing Phthisis "under the conditions of our fickle and somewhat rough climate." To this appeal no answer was or has ever been made, but the following quotations from writings by these two gentlemen show conclusively that the *Lancet*, by a little exercise of memory, might have known what their answer could be, and would have seen that it could not be anything else.

Ten years previously, in 1862, Dr. C. J. B. Williams had delivered the following opinion as to the efficacy of cod liver oil, and of the other modes of treatment used against Consumption previous to my discovery. Dr. Williams had been, with Dr. Hughes Bennett, of Edinburgh, the principal means of introducing the use of cod liver oil into England, and consequently was not inclined to underrate its value. In his Lumleian Lectures on "Failure and Success in Medicine," reported in the *Lancet* for April, 1862, Dr. Williams had spoken as follows:—"I have notes of *seven thousand cases* of Phthisis, and I find the average duration of life under the disease has been four years. They have terminated, in the immense majority of cases, in death. *By the introduction of Cod Liver Oil* and *other agencies* we have lengthened the duration of the disease. I have notes of twenty-four cases to which the word cured could be applied. Of partial cure, I have thirty-one cases. There are twenty

cases in which life was extended from six to sixteen years. *These three classes make up in all seventy-five cases. These are all the successes of which I can boast.*"

Later on, in 1871, consequently before the article published by the *Lancet* in 1872, the same Dr. C. J. B. Williams, in his work on "*Pulmonary Consumption*," London, 1871, p. 326, had said, "the Hypophosphites of soda and lime so strongly recommended by Dr. Churchill, of Paris, have in my hands proved decidedly beneficial in certain cases. It has happened that when a patient after having derived great benefit from taking the oil, *halts or even loses ground*, the addition of the Hypophosphite has been followed by a marked change for the better, flesh and strength have been gained, and the chest symptoms have been more or less improved."

On the other hand, Dr. Henry Bennet, in his work on "*Pulmonary Consumption*," London, 1866, p. 37, had written as follows:—"During the last seven years I have administered the drug to a large proportion of those whom I have attended. *I could furnish* Dr. Churchill with *many cases of cure, myself included*, which have apparently taken place under the influence of the Hypophosphites"; and again, pp. 151-156, "The above views must have gained greater credence and weight with the profession than is generally admitted, for *I am seldom consulted by a new patient at Mentone each successive winter, without finding that he or she has been taking* phosphorus in

some shape or other, and *that* when the prescriptions are signed by *the heads of the profession.*" I will not lay any stress upon this point. The rest of the story may be found in my book.

At the present day the Hypophosphites have come into such general use, that I never meet with a case of Consumption in which they have not been given at some time or other.

Parallel with this extension of the use of my discovery, Consumption has steadily decreased, and this decrease has continued, not only in the same, but in a constantly augmenting ratio. While from 1855 to 1865 the decrease in the death-rate from Consumption as compared with former years was 11 per cent.; from 1865 to 1875 the decrease was 15 per cent. upon the mortality of the previous ten years; and from 1875 to 1885 it exceeded 25 per cent. as compared with the mortality of 1865-1875.

Now, how has this been brought about? By the use of the Remedy discovered and made known by me in 1857. The Hypophosphites, in some form or other, are now universally given in Consumption by physicians in England, as they are all the world over, but they are not always, in fact I may say they are seldom, prescribed upon the strict scientific lines which I have pointed out as essential to their uniformly successful action. So that, although the general result has been the decrease in the mortality of Consumption, mentioned above, the disease is not yet stamped out as it might, and

as I have said, it some day will be ; because *the special fact of the curability of* all *cases of Phthisis by the specific action of the Hypophosphites given under certain ascertained and definite conditions*, is not a recognized scientific truth now, any more than it was thirty years ago.

I will not stay to explain the many and various causes which have concurred in preventing such a very desirable result. I have done so elsewhere, but I may do myself the justice to say, that they were foreseen and foretold by me, from the very first.

In 1859, in a letter to Horace Greely, the editor of the New York Tribune, I said, "it is not until two generations of medical men shall have passed away that my discovery will rise above the mists of controversy into the serene region of scientific truth."

In the preface to my book "*On Consumption and Tuberculosis*" (London, 1875, p. ix.), I said "The spread of a new idea is governed by laws as constant, if we only knew them, as the diffusion of heat or light. Most of the forces which stand in the way of any public recognition of my discovery, will only become extinct in another generation and a half."

But the application of my discovery did not, and does not, rest with the Medical Profession alone. It has, unfortunately, in one sense, almost from the very nature of things, gone out of their hands into that of the public ; for, as I said in the preface to my French work, "*De la Phthisie*," (Paris, 1864, p. xi.) : "The Medical Profession has never comprised so many

men sincerely anxious for the progress of their art as at the present day, but a fact which is of direct interest to one eighth of the human species, which involves a question of life or death for one third of the adult population, cannot be shut up within the limits of professional opinion or of professional etiquette, nor can it be disposed of without full and exhaustive discussion. A scientific application, when completely matured, is no longer confined to a professional class, but enters into the sum total of knowledge belonging to all educated persons."

This is what has happened for the Hypophosphites, and it has happened the more easily because, as I had pointed out, at the time, their usefulness is not limited to the cure of Consumption.

The fact that Consumption *was* cured by the Hypophosphites led me, in the course of my researches, to take a much wider view of the problem I had undertaken to work out ; and instead of merely being a technical question of the cure of a special disease by a specific remedy, it grew gradually under my hands until I found that it contained within itself the practical demonstration of a principle of paramount value, leading to important consequences in Biology, in Physiology, in Pathology, in Hygiene, and in other aspects of Therapeutics.

Having undertaken not only to prove that Consumption could be cured by the Hypophosphites, but also that the pathological hypothesis from which I had started, was based upon strictly scientific grounds,

I was necessarily led to examine whether the great mass of interesting and curious facts relating to Tuberculosis, which had been slowly collected by many generations of observers, could be referred to and connected in any way with the fundamental idea that Consumption was dependent upon the deficiency of a *phosphide* element naturally existing in the animal system.

The first thing, therefore, was to examine what were the reasons for admitting the existence of such an element; and next, supposing it did exist, what was its function in the organism. I have written two large works, one in French, of 988 pages, to which I have already frequently referred, and another in English, of 614, a great part of which is devoted to this special subject. I have, I think, conclusively established the following facts, for the full proofs of which I must refer you to these works: "*De la Phthisie*," pp. 735—744; "*Consumption and the Hypophosphites*," pp. 216—226.

1st. Although the chemical evidence on the point is very imperfect and inconclusive, there can be no doubt of the existence in the animal system of a *phosphide* element, in which the phosphorus is not fully oxydized, and is molecularly combined with organic material. Before my researches on the subject, this *phosphide* element had been scantily and imperfectly examined by chemists, and its very existence was doubtful, since two such eminent chemists as Liebig and Mülder held opposite views on the

subject. This same element had been almost entirely neglected by physiologists, and altogether overlooked by pathologists, yet it is probably a paramount one in the animal organism, since the attention called to it by my researches has been recognized as such by some of the most eminent Chemists, as Liebreich and Thudichum (Thudichum, *Chemical Physiology*, 1872, p. 40). It is met with in all the most important parts of the body—in the brain and nerves, of which it is *the special characteristic*, in the blood globules, in the yolk of egg, in the spermatic fluid—and is generally diffused, though in minute proportions, throughout the system.

2nd. The *phosphide* element is entirely distinct and different from the greater number of the other compounds in the system containing phosphorus, in which the phosphorus exists in a fully oxydized condition. For this reason I proposed that the first should be called the *phosphide*, and the latter the *phosphatic* element. The phosphatic element has, so to speak, a very secondary part to play in the animal system. It seems to exist chiefly in the form of salts, such as the phosphates in the bones; and, as I pointed out, its value is so secondary, that in certain classes of animals, for instance, the herbivora, its place is, to some extent, filled up by the carbonates.

3rd. The *phosphide* element, owing to its great affinity for oxygen, and its high calorific capacity, is most probably the *initiator* of the slow combustion, and the prime beginner of the metamorphoses

and molecular changes which constitute in animals the essential condition of all the higher manifestations of life. After undergoing and initiating this primary oxydation, it probably proceeds through successive degrees of modification, ending in its complete and final saturation and its rejection from the system in the form of phosphates.

4th. Although the *phosphide* and the *phosphatic* elements are distinct, both in composition and functions, there can be little doubt that there is some connection between them, and that a variation in one will entail a corresponding variation in the other; thus, for instance, the increased excretion of phosphates following after brain work or brain excitement (as in the insane) is due not to the mere elimination of the *phosphatic* element, already existing as such in the system, but to the increased oxydation, and consequent wearing out of the *phosphide* element itself.

5th. The want or the waste of this oxydizable phosphorus must no doubt give rise to a special disturbance of nutrition and of the organic metamorphoses which constitute life, and, in its turn, this disturbance, under the influence of secondary causes, will initiate various morbid changes, hitherto looked upon as distinct and independent diseases, although they all possess one common feature: that of lowered vitality—showing itself by general weakness and organic debility. This common feature, which occurs specially at the different periods of growth and

development, may give rise to distinct morbid conditions, such as tuberculosis; rickets; scrofula; mesenteric disease; the arrest of growth in children at the two periods of their first and second dentition; the disturbances incidental to puberty in both sexes, such as chlorosis in the female; the troubles accompanying the completion of the osseous system; those which are so often met with in pregnancy; and, lastly, that condition of debility and langour frequently noticed in young people between the ages of eighteen and twenty-five, called by the vague name of *Anæmia*, popularly termed *Delicacy*, and which is often the forerunner, or even the beginning of Tuberculosis.

I showed that all these different disturbances of health possess a common character—impaired vital energy coincident with a decrease, sometimes in the quantity and always in the quality of the principal element in the blood, its globules, and that all these complaints improved, and in time disappeared, by the methodical use of the Hypophosphites.

6th. I thus demonstrated that the vague ideas connected with the morbid condition of weakness underlying many different and apparently unrelated diseases, which was, and still is, designated by the terms *lowered vitality*, and referred to some undetermined change in the mysterious principle called the *vital force*, and as such likely to be beyond our control, might be dismissed, and make room for a positive, *scientific*, and practical conception, that of the *deficiency*

of a primordial chemical principle, *the phosphide element*, the chief initiator of the organic changes which constitute Life.

But while showing the importance of this view and indicating the great value of the Hypophosphites as primary remedial agents, as direct exciters of the three fundamental phenomena of innervation, of hæmatosis, and of nutrition, I expressly stated that although I could report many observations of my own in support of their action in other diseases than Phthisis, based upon their power as primordial stimulants, I refrained, because, by so doing, I should be led away from the special object I had in view, the *Specific Cure of Phthisis.* I said that, in my opinion, the object of Therapeutics ought to be, not the discovery of *Drugs*, but of *Remedies*, and that if I undertook to establish in a scientific manner the results arrived at in the above complaints by the use of the Hypophosphites, I should have to enter upon a very vast subject, involving an examination and discussion of the pathology and therapeutics of each of the morbid conditions above referred to.

My purpose was not to set forth to the world at large, as I might have done, the universal virtues of a Panacea, but to lay before the Medical Profession the proofs that a result thought to be, until then, "as chimerical as the search after the Philosopher's Stone" (*Courrier Médical*, Paris, 1864), was *always* attainable under certain ascertained and scientifically defined conditions.

This was a mistake upon my part, for unfortunately it has so happened that this scientific aspect of my discovery has been neglected by most members of the Medical Profession. Physicians are, it is true, universally employing the Hypophosphites; many of them carefully and successfully. Hardly any patient is now affected with Phthisis without, at some time or other, having the Hypophosphites or some other kind of phosphorus compound (mistakenly thought equivalent to them) administered to him, but all the distinctions and peculiarities which I had pointed out as essential to the success of the treatment, although carefully observed and followed out by some practitioners, are by many others very frequently ignored. The precautions and safeguards which I laid down and minutely described, are to be found in none of the medical text books: they have never given rise to any discussion or objection; hardly any attempt, as far as I am aware, has ever been made to verify or refute them; they have been dropped as if they were mere useless, idle chatter—nothing more. Such a thing as this could never happen in any other branch of knowledge than Therapeutics. In Physics, in Chemistry, in Pharmacy, in Surgery, no one would dare to say that he neglected and ignored all the conditions of an experiment or an operation.

Here are a few instances:

The Hypophosphites and the Phosphates are confounded together, which is just as if it were said that coal and ashes are the same thing.

Instead of the Hypophosphites, not only Phosphorus itself, but other oxydizable compounds of phosphorus, which I had examined and discarded because their use is dangerous, are frequently employed, and tried over and over again in spite of failure.

The different Hypophosphites of Lime, Soda Potash, Ammonia, Iron, Manganese, Quinine, Alumina, Baryta, Magnesia, Zinc, Bismuth and Strontia, which have, each one of them, distinct properties almost always quite different from those of the rest, and which have all been studied by me with regard to their physiological and therapeutical action, have for the most part been confounded one with another, and are being used indiscriminately, without any regard to their special and distinctive action upon the system. I studied minutely and experimented upon animals and upon myself all those which might be used in the treatment of Phthisis. Of those above named, some I found to be specific in their action, and therefore indispensable; others useful; others, again, I stated to be injurious in Phthisis, and never to be used in that disease, although they were useful in other complaints. Nevertheless, by some practitioners, the first seven, at least, are frequently confounded or mixed all together, and used without any distinction, discrimination, or scientific prevision. Not only are they thus all jumbled together, but their efficacy is constantly interfered with, or vitiated entirely by their association with

other useless, contradictory, or dangerous drugs, of which I will say more anon.

This has had very lamentable consequences. While some of the members of the medical profession have thus been using the Hypophosphites not as a remedy, but as a drug, the speculators and traders in patent and secret medicines have seized hold of them; have made large fortunes out of them; and have quacked them indiscriminately as the greatest invigorators and strengtheners of the system, under all sorts of names, either as *Secret Medicines*, or as *Foods*, *Beverages* and *Tonics*.

I have now before me a list of more than thirty names, many of them of persons without any Medical training, and equally ignorant of Medicine, of Pharmacy, and of Chemistry, who together advertise more than thirty different compounds or preparations in which some form of Phosphorus is either the avowed or the secret element. It has become a habit for many men, when they have any feeling of fatigue or exhaustion, to take what is called a *Tonic*. Most of these so-called tonics contain some one or several compounds of Phosphorus, and produce the usual effects consequent upon its introduction into the system—increase of nervous power, that is, of strength, of hæmatogenesis or the blood-making process, and of nutrition, and thus bring about an improvement in the appearance and general health of the person. These preparations are offered to the Public, not only

as Medicines, or as Secret Remedies, for Consumption and other diseases, but as *Foods*, *Drinks*, or *Tonics*, for common and every day use.

But if the proximate principles of which the system is built up are the necessary ingredients in it and the indispensable agents by which the vital functions are carried on, it stands to reason, and requires no demonstration, that not only the quality but the quantity of each one of these proximate principles cannot be an indifferent matter, and that although an element may be the most important in the system, it may become injurious or dangerous if taken in too large quantity. This is what has happened, and is happening every day, with the oxydizable phosphorus compounds.

So that while the Hypophosphites are being universally used by the Medical Profession for the cure of Phthisis and the different complaints I have mentioned above, other but dangerous compounds of Phosphorus are spread still more widely all over the country, and are administered to all sorts and conditions of men, without the recipients being hardly ever at all aware that they are taking anything else than the most ordinary, indifferent, or innocent substance: say some herb, plant, or fruit of everyday use. Thus Phosphorus itself, which, since its discovery more than two hundred years ago, has been vainly tried over and over again by physicians, and abandoned as too dangerous to be used with any degree of safety, even with the most minute precautions, is

sold as a drug that everyone may take: other oxydizable compounds of phosphorus which are hardly less dangerous than phosphorus itself: certain Salts, which, as I had pointed out, ought to be given only in special cases—all these very different compounds are now recommended and sold indiscriminately by persons entirely ignorant both of Medicine and of Chemistry, and are used by the public. This you may see for yourself. You can hardly take up a newspaper, whether professional or otherwise, without noticing one or more advertisements, generally of the largest and most staring kind, announcing the wonderful properties of some of these preparations.

The lamentable consequence of this is that while Consumption in England is steadily on the *decrease*, Cancer, on the other hand, is steadily on the *increase*, as is shown by the following Table:—

TABLE

SHOWING THE *DECREASE* OF CONSUMPTON AND THE *INCREASE* OF CANCER IN ENGLAND AND WALES, FROM 1855 TO 1885.

	Population.	Total Deaths.	Deaths. from Phthisis.	Proportion to Population.	Proportion to Total Deaths.	Deaths. from Cancer.	Proportion to Population.	Proportion to Total Deaths.	Percentage of Increase or Decrease for each period of Ten Years, as compared with the preceding.	
									Phthisis. Decrease.	Cancer. Increase.
1855	18,829,000	426,646	53,135	1 in 354	1 in 8	6119	1 in 3075	1 in 69.7	from 1855 to 1865	from 1855 to 1865
1856	19,042,412	390,506	48,950	1 ,, 389	1 ,, 7.97	5859	1 ,, 3250	1 ,, 66	11 per cent.	15 per cent.
1857	19,256,516	428,731	50,106	1 ,, 382	1 ,, 8.55	6257	1 ,, 3077	1 ,, 68.5	from 1865 to 1875	from 1865 to 1875
1860	19,902,713	422,721	51,024	1 ,, 390	1 ,, 8.28	6827	1 ,, 2915	1 ,, 61.9	15.5 per cent.	20·6 per cent.
1861	20,119,314	435,114	51,931	1 ,, 387	1 ,, 8.37	7276	1 ,, 2765	1 ,, 59.8	from 1875 to 1885	from 1875 to 1885
1865	21,145,151	490,909	53,734	1 ,, 393	1 ,, 9.1	7922	1 ,, 2670	1 ,, 61.9	25.5 per cent.	20 per cent.
1870	22,501,316	515,329	54,231	1 ,, 414	1 ,, 9.5	9530	1 ,, 2361	1 ,, 54	Total percentage during the 30 years	Total percentage during the 30 years
1875	24,045,385	546,453	52,943	1 ,, 454	1 ,, 10.3	11336	1 ,, 2121	1 ,, 48	61 per cent.	74 per cent.
1880	25,714,288	528,624	48,201	1 ,, 533	1 ,, 10.96	13210	1 ,, 1946	1 ,, 40		
1885	27,499,041	522,750	48,175	1 ,, 570	1 ,, 10.85	15560	1 ,, 1767	1 ,, 33		

The Table shows that previous to the publication of my discovery, there had been an *increase* of Consumption (in 1857), and a *decrease* of Cancer (in 1856).

Now here are three certain facts. Of these, two cannot be controverted :

The *decrease* of Consumption :

The *increase* of Cancer :

The third, which anyone may ascertain for himself, is :

The general empirical, popular, unscientific use and abuse of heterogeneous and dangerous preparations of oxydizable phosphorus.

And the coming of the three together is not a mere coincidence, but is owing to a real correlation between them.

This correlation, depending upon a direct causal connexion between the *phosphide* element in the animal system and these two widely different diseases, was, as I have said, discovered and pointed out, for the first time, by me more than twenty years ago, as I shall now show you.

In order to establish my view of Consumption upon a scientific basis, I was led to institute a minute enquiry into every known fact connected with Tuberculosis, such as: its prevalence and greater or less curability at different ages ; the influence upon it of climate and temperature, of diet and hygienic conditions ; its distribution in the animal kingdom, and, above all, its connection with other morbid states and diseases. After an exhaustive enquiry, in which I may do myself the justice to say that no one single fact was minimized or misrepresented, I came to the conclusion that there was hardly one of these facts

that did not harmonize and fit in, often down to the most minute details, with my theory, that *the essential cause of tuberculosis is the undue waste, or the want in the system of its oxydizable phosphorus*, that is of the *phosphide* element.

Among the diseases which I was led to examine, as far as concerned its relations with tubercle, Cancer was one of the most important and most striking, because Cancer, a comparatively rare disease, was recognized to be as incurable as Consumption itself; and because it had been pointed out by one of our most eminent pathologists, Dr. Walshe, that there was almost a complete antagonism between it and Tubercle (" *The Nature and Treatment of Cancer*," London, 1846: p. 185). Walshe had found that in 104 post mortem examinations of cancerous patients, traces of tubercle were met with only in 7. This had been confirmed by other observers. Dietrich, in 150 cases of Cancer, only found *one* case of tubercle. Holden saw, that out of 7030 persons under 40, 1279 had had antecedents of tuberculosis: among this number there were only eleven cases of Cancer, while there were 99 cases of Cancer among the remaining 5751. He found that in 1,000 cases of death from internal disease there were 30 cases of Cancer: in only one of which was there a coincidence of Cancer and Tubercle, and only in one case more was there tubercle in the family of the cancerous patient.

This was a very striking and remarkable fact of

which no explanation had been given, nor has ever been attempted, and the key to which was afforded, as I discovered, by my conception of the nature of Consumption.

I found that while Consumption was supposed to depend upon the *deficiency* of the *oxydizable* phosphorus—(the *phosphide* element) everything known on the subject pointed to the conclusion that Cancer itself depended, on the contrary, upon an *excess* of this same *phosphide* element.

This was stated for the first time in my French work, "*De la Phthisie*," p. 758 (Victor Masson et fils, Paris, 1864); and in support of this view I alleged the following proofs :—

1. After reminding the reader of the great importance of the phosphide element in the brain and nerves (p. 20), I pointed out that the external appearance of certain forms of Cancer is so like brain substance, that they have received the name of Encephaloid, or brain-like.

2. I showed that almost every chemist who had analyzed cancerous matter, had noticed the existence in it of a considerable quantity of a phosphorized substance, sometimes in such large proportions as to excite the astonishment of the analyst; and I gave in detail the chemical analyses of Vingtrinier, Baudrimont, Foy, Wiggers, and Gorup-Besanez.

3. I added that the phosphide element is not found in vegetables, except perhaps in certain seeds, while it exists in animals; consequently that her-

bivorous animals, as pointed out by Liebig, contain less phosphorus in their system than the flesh-eating animals, because they find less of the phosphide element in their food. I showed the great and singular importance of this fact when viewed in connection with the researches of Rayer, who had found that in herbivora Tuberculosis is very common, and Cancer is very rare; while, on the contrary, in the flesh-eating animals the opposite prevails —Cancer is common, and Tuberculosis is not so. Rayer had further ascertained that this also holds good with regard to birds: Cancer is common and Tubercle rare among birds of prey: birds which do not live upon flesh are, on the contrary, liable to Tubercle and not to Cancer.

4. I explained that as the phosphide element is the chief initiator of cell-growth, it is more liable to waste or to deficiency in infancy and youth, the period when it is employed in promoting the formation of new tissues, and in building up the system, than in manhood, when growth being stopped, there is not the same demand for it. This, I showed, accounts for the greater frequency of Tuberculosis up to the middle period of life, and its diminishing frequency later on, while Cancer is distributed in an inverse ratio. Thus in the decennium of 1871 to 1880, the number of deaths by Cancer among persons of 20 years of age was 28 for 1,000,000 persons living; at 45 the proportion jumps up to 1263; at 65 to 3116; at 75 to 3333. Tubercle, on the other hand,

in the same period caused the death of 3,117 persons per million, living at the age of 20; of 3,132 among one million at the age of 45; of 1,476 among those at the age of 65; and only of 492 at the age of 75 and upwards.

5. To this must be added the well-known fact, apparent to everyday observation, that Tubercle is the disease which attacks the weak and delicate, those whose system has been exhausted by want, by overwork, by excess, by rapid growth, by previous disease, or by anything which induces waste, without corresponding repair. Cancer, on the other hand, generally appears in persons who are in the enjoyment of what is comparatively vigorous health, which does not begin to show signs of impairment until the the diathetic or constitutional condition has begun to be established.

6. I also said that as the presence of the phosphide element is one of the conditions, and one of the characteristics of the integration into the system of new materials, consequently of the growth of tissue, its large proportion in cancerous growths would account for their constant tendency to increase and to involve the neighbouring parts.

Such were the relations which I was the first to show as existing between Consumption and Cancer, and, as far as I am aware, this is the first and only attempt that has ever been made to explain the nature and cause of this latter disease. Like every one of the different scientific questions raised by my discovery

of the Remedy for Phthisis, this one also has been completely ignored—a neglect the more to be regretted, as this conception of Cancer raises a very distinct and definite issue, which, if followed out to its legitimate consequences, might, perhaps, lead to the discovery of a means of cure.

But since then another singular circumstance bearing upon this subject has arisen to which I wish particularly to call your attention. In my different works on the cure of Consumption by the Hypophosphites, I laid special stress upon the differences in physiological action which I had found, by experiment upon myself and upon animals, to exist between the various Salts mentioned above (p. 25). While some are integrators—that is, are incorporated into the system, and contribute to the building up of fresh tissues—others on the contrary, act as solvents or eliminators, and promote the disintegration and the removal of effete or diseased material. Some of these ought therefore to be used uniformly, if not exclusively, during the time of growth and development; others are of special utility, or are even the only ones that ought to be prescribed during the periods of life where development has ceased, or when the vitality of the tissues has become stationary, or retrograde.

This distinction, which is one of great importance, has been unfortunately ignored as completely as most of the other details of my discoveries, although I believe they were entitled to consideration, not

only because they had cost me much thought and labour, but because they give to the whole series of facts upon which my discovery is based a scientific accuracy and coherence which, as far as I am aware, has never yet existed in any one branch of medical science.

So that not only are other oxydizable compounds of phosphorus of a highly dangerous nature confounded in practice with the Hypophosphites, and empirically taken instead of them by the public, but the different Hypophosphites themselves are used one for the other without any reason, apparent or real. Very frequently five or six of them, integrators as well as eliminators, are all jumbled up together, and administered indiscriminately to patients of all ages, and for altogether different diseased conditions. In this way, the child or the Consumptive gets what ought to be given only to a person of mature age, suffering from Bronchitis or from debility. The full grown man, or the old man, suffering from exhaustion produced by overwork, from weakness during convalescence after disease, or from premature senility, gets the Hypoposphites which ought to be given only to those who are still in the ascending period of life.

There is worse still. Some of the most favourite —I ought to say the most fashionable formulæ in use, not only among the public, but also among the profession, (for, alas! there are fashions in medicine)—consist of a mixture of various Hypophosphites, comprising almost every one that can be used

at all as a medicine, and supplemented by a daily *dose of a tetanic poison*, nux vomica, or its active principle, strychnia. These preparations are recommended and given as a simple *tonic*, (as a *daily pick-me-up*, to use the common expression). *They are taken chiefly by men* as a means of rapidly restoring the energy exhausted by the wear and tear of modern life. In hundreds of instances they are used daily by a man just as he would take the most innocent cordial or a transient restorative. But alas! for him it is not so. If the phosphide element be the main constituent of nervous matter and a special and paramount exciter of vital energy, it must necessarily, when introduced into the system, pass through the elementary structures to which it belongs in the organism, be incorporated with them, subserve and stimulate their functions, and be eliminated after this duty is fulfilled. But if such a primary constituent, say, for instance, the characteristic element of nervous matter, is introduced into the system in undue proportion, at a period of life when, instead of being deficient it is generally in excess, and has even a tendency to become more so with advancing years; if at the same time the patient, or rather the healthy recipient, receives along with it a disturbing element, a poison, which interferes with the normal waste of the nervous substance, by producing convulsive, irregular, fitful and unnatural usings up of it; what consequences may we naturally expect to follow, bearing in mind what has been

said above with regard to the apparent and probable, or possible, connection between nervous matter and Cancer ? (p. 32). May we not think that some of the constituents of nervous matter not being exhausted in a natural way, and not being sufficiently used up to allow of their elimination from the organism, undergo some abnormal change which makes them unnaturally active, so that they are deposited in the tissues, excite unhealthy cell-growth, and thus produce the development of new and encroaching (p. 32) that is, malignant tissue—in a word, Cancer ?

I can hardly find terms to express with decency and moderation what I think of the use of formulæ, such as those I see prescribed and advertised every day, in which a confused jumble of a number of Hypophosphite salts is associated with such a poison as nux vomica, or strychnia. In a Pharmaceutical point of view they are outrageously absurd ; in a Medical one, it is hard to say which is the greater, their absurdity or their danger. I hardly ever meet with a patient in whom Phthisis has been only arrested for a time, but not cured, without finding that this unfortunately incomplete result is due to the use—often to the persistent use—of some preparation of this kind. As for the large number of healthy people who are in the habit of swallowing daily such mixtures with the idea that they are merely making use of a transient stimulant, I am afraid that too many of them will go to swell the number of the victims of Cancer. If Therapeutics were not in an

utterly chaotic condition such things would be impossible. They would have no chance of being allowed, still less of being adopted, by the members of a Scientific Profession. They are nothing better than a reversion to a blind and groping Polypharmacy, and will, before long, be looked upon as we now look back on some of the barbarous nostrums—such as the scrapings of dead men's bones—which we meet with among the *Recipes* of our forefathers in the Ignorant Past.

These are, in my opinion, the causes of the *persistent* and *yearly Increase of Cancer in England since* 1858. But another explanation of it has been given, which I will now examine. Dr. Ogle, in his letter to which I have already referred, in order to account for this increase of Cancer, called attention to the fact that the increase of the mortality for males has risen 62 per cent. in 20 years, while the rate for females has only risen 43 per cent. He adds, that if the rise were real and not apparent, there would be no reason why the male sex should suffer more than the female, and that the true explanation therefore would be, that as the cancerous affections of males are internal, in a much larger proportion than those of females, consequently more difficult of recognition, any improvement in medical diagnosis, would add more to the male than to the female reckoning.

Whether there really has been any improvement in the diagnosis of Cancer is, I think, very questionable.

The diagnosis depends chiefly upon the microscopic characters, and it can hardly be said that these are more certain now than they were twenty years ago. Instances of actual and present experience would seem to show that they are not ; but, even admitting the reality of such progress, it would not bear out Dr. Ogle's explanation for several reasons.

1. If an improvement in diagnosis did account for the increase of the male mortality, it still leaves the female unexplained.

2. But the diagnosis of diseased growths in the male is not more difficult at one period of life than at another. Yet the mortality from Cancer offers no greater proportionate increase in males than in females until after the age-period of thirty-five. This is shown by the following Table, which gives, from the *Registrar General's Reports*, the number of males and females who died of Cancer, for *one million* persons living, at different age-periods during each of three successive terms of ten years from 1851 to 1880, to which I have added the corresponding numbers for the year 1885, with the percentage of increase or decrease for each sex.

TABLE showing, for three terms of ten years (1851-60, 1861-70, 1871-80) and for the year 1885, the number of deaths from Cancer in England and Wales for ONE MILLION persons living at each age, with the percentage of increase or decrease at each term as compared with the first ten years, 1851–60.

MALES.

Number of Deaths from Cancer for One Million of Males living at each age period.				Increase or Decrease per cent. of the Mortality at each age-period for two terms of Ten Years (1861-70, 1871-80) and for the year 1885, as compared with that of 1851-1860.				
AGE.	1851-1860.	1861-1870.	1871-1880.	1885.	1851-1860.	1861-1870.	1871-1880.	1885.	AGE.
0	21	13	13	21		— 38	— 38	—	0
5	10	8	7	7		— 20	— 30	— 30	5
10	8	8	8	13		—	—	+ 62	10
15	16	20	18	20		+ 25	+ 12	+ 25	15
20	27	27	28	41		—	+ 4	+ 51	20
25	63	61	71	81		— 3	+ 12	+ 28	25
35	174	205	241	306		+ 17	+ 38	+ 75	35
45	422	539	709	936		+ 27	+ 68	+ 121	45
55	931	1208	1598	2075		+ 29	+ 71	+ 122	55
65	1504	1877	2623	3235		+ 24	+ 74	+ 115	65
75	1749	2295	3035	3322		+ 31	+ 73	+ 90	75

TABLE showing, for three terms of ten years (1851-60, 1861-70, 1871-80) and for the year 1885, the number of deaths from Cancer in England and Wales for ONE MILLION persons living at each age, with the percentage of increase or decrease in each term as compared with the first ten years, 1851–60.

FEMALES.

Number of Deaths from Cancer for One Million of Females living at each age period.					Increase or Decrease per cent. of the Mortality at each age-period for two terms of Ten Years (1861-70, 1871-80) and for the year 1885, as compared with that of 1851-1860.				
AGE.	1851-1860.	1861-1870.	1871-1880.	1885.	1851-1860.	1861-1870.	1871-1880.	1885.	AGE.
0	23	13	12	13		− 43	− 47	− 43	0
5	9	7	7	5		− 22	− 22	− 44	5
10	9	8	8	7		− 11	− 11	− 22	10
15	18	17	16	17		− 5	− 11	− 5	15
20	30	33	27	34		+ 10	− 10	+ 13	20
25	141	163	175	163		+ 15	+ 24	+ 15	25
35	592	673	797	843		+ 13	+ 34	+ 42	35
45	1278	1538	1771	2083		+ 20	+ 38	+ 63	45
55	1853	2300	2770	3203		+ 24	+ 49	+ 72	55
65	2351	2810	3538	4664		+ 19	+ 50	+ 98	65
75	2341	2826	3562	4882		+ 20	+ 52	+ 109	75

From this it appears that the mortality in both sexes had diminished for all under the age of fifteen, except for males in 1885, when there had been an increase of 62 per cent.; but this may perhaps be an error, and the figures are so small that a variation of five deaths (from eight to thirteen), per million of persons living—for that is what it comes to—immediately gives that large percentage.

It is only after twenty-five that the deaths reach a certain figure, and exceed one hundred per million living. At the age-period of twenty-five the percentage of increase for the females is greater than for males in the two first decennia (males – 3 + 12, females + 15 + 24). At thirty-five, the difference is slight for the two first decennia. The great increase in the mortality in both sexes is for the three age-periods of forty-five, fifty-five, and sixty-five. In 1885, for the last age-period of seventy-five the female mortality rose in a greater ratio than the male (males + 90, females + 109).

This is altogether inexplicable upon the supposition that the increase is due to an improvement in diagnosis, because, as I have said, the nature of a diseased growth is not more difficult to recognize after forty-five than before. Above all, improvement in diagnosis fails to explain how the mortality, not only for males, but also for females, increases in an *augmenting* ratio from one term of years to another. This must be due to some cause common to both sexes, and persistent in its action; such a cause as is found in the idea of a

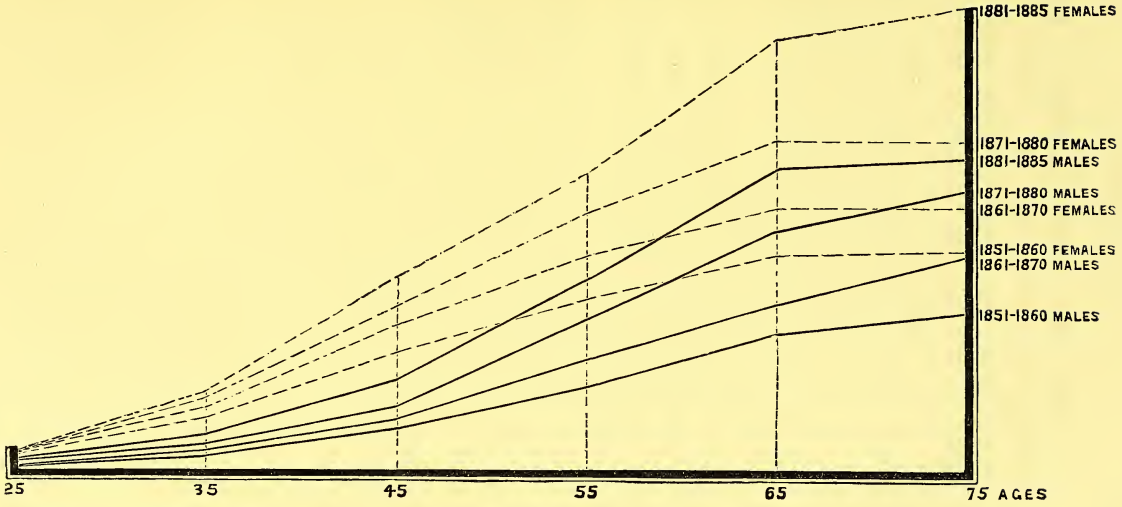
permanent modification produced in the system by an *artificial* excess of the *phosphide* element. In infancy and youth, up to twenty, the *phosphide* element is used up for promoting growth, and is seldom in excess until twenty-five, when the requirement for it begins to decrease. When the age of growth is over, from twenty-five to thirty-five, the supply begins to exceed the demand, but only after thirty-five does the supply for the natural requirements become superabundant.

Now, if this *phosphide* element is supplied to the system without rule or measure during all these different stages of life, the results, if my theory of Cancer be correct, will agree with the above figures.

Further, from thirty-five to seventy-five, at the time when all growth is arrested, if the males get a larger proportionate supply than the females in order to enable them to stand the strain of life which is still going on (p. 37), that will be the period when their mortality will reach its highest pitch, to fall again below the ratio for the females when the active period is overpassed.

This is graphically and more clearly expressed in the following diagram, drawn upon a scale of $\frac{1}{20}$th of an inch for every hundred deaths, so that, for instance, the number of deaths from 1861 to 1870 at 45 having been 539, is represented on line corresponding to that age by $\frac{5}{20}$ths + $\frac{39}{100}$ths of $\frac{1}{20}$th of an inch, or $\frac{539}{2000}$ths, or 0·2695 of an inch.

DIAGRAM showing the number of Deaths from Cancer in England and Wales for each of the sexes from 1851 to 1885 at each age-period of ten years above 25.



There are other points to which I might wish to call your attention, such as an increase of the mortality from Bronchitis keeping pace with the decrease of Phthisis. It would be easy for me to point out the connection between these two facts; but this may stand reserved for some future opportunity, as I wish to confine myself to one subject, *The Increase of Cancer in England, and the Cause of it.*

I think I have placed clearly before you several distinct and definite issues:

1st. The dependence of Consumption, discovered and published for the first time thirty years ago, upon *a deficiency of the* phosphide *element contained in the animal system.*

2nd. The dependence of Cancer, discovered and published twenty-three years ago, upon a contrary condition: an *excess* of the same *phosphide* element.

3rd. The enormous extension in England of the use, among the community at large, of all kinds of compounds of phosphorus sold, not only as medicines, and as Secret Remedies, but under other names, as inoffensive Foods, Drinks, or Tonics, which every one may use at any time, at all periods of life, and in any quantity. Of these some few would be nearly inert, if, as is said of them, they consisted entirely of *phosphates*, and thus only contained a *phosphatic* element (which is ignorantly confounded with the *phosphide* element, p. 24); but these so-called phosphates, like almost all the so-called *Foods*, *Drinks*, and *Tonics* which I have examined, are highly dangerous,

because they contain, besides the phosphates, oxydizable phosphorus compounds, in which the phosphorus exists in a chemically free, or imperfectly combined and unsaturated condition. Other preparations, again, the Hypophosphites, are the most potent, the most valuable, and, as time will show, *the safest, when properly used, of all remedies yet known*, but they are of different kinds, and, according to the differences in their composition, have very distinct qualities and effects. These effects were carefully studied and explained by me many years ago, and the different actions and properties of each were minutely pointed out, yet at the present day they are frequently employed promiscuously, or, to use the only appropriate term, are *jumbled* together, and administered in the form of confused mixtures, which are rendered dangerous by the addition of a violent poison.

4th. Following upon the legitimate use by the Medical Profession of my discovery of the medicinal properties of the Hypophosphites there has been, and still is, a continued and yearly increasing *diminution* in the proportion of deaths from Consumption, which has fallen in thirty years from *one* in *eight* to *one* in *eleven* of the total death rate ; but at the same time owing to the perverse or the ignorant misuse of my discovery by others, and the employment of similar but dangerous compounds and formulæ, there has been a corresponding yearly and increasing *augmentation* in the number of deaths from Cancer, which has risen

in the same period of thirty years from *one* in *sixty-nine* of the total death rate to *one* in *thirty-three.*

If these are mere coincidences, they are very singular ones indeed, such as, I think, have never occurred yet; and the only thing like it which has ever happened before is what occurred after the discovery of vaccination.

At the end of last century, before Jenner's great discovery, Small-pox was the cause of one-eighth of the total mortality; in 1857, the number of deaths caused by it had fallen to 1 in 106 of the deaths from all causes.

In that year the place of Small-pox had been taken by Consumption, which caused, in its turn, *one-eighth* of the total deaths.

I then stated that the time would come when by the employment of the means I had discovered, and which I had made public, Consumption would become as insignificant as Small-pox; but that it would take sixty years before this fact was realized. That is now thirty years ago, and although my remedy for Consumption has been and is still most frequently used in a purely empirical and utterly unscientific manner, it will be seen from the following Table that in England and Wales alone more than *Two Hundred Thousand* persons have been saved from death by Consumption since 1857, and that nearly *Eighty Thousand* more might have been saved in like manner, if the same death-rate which existed in 1885 had been established in 1857; that

is to say, if what is being done now had been done thirty years ago.

In the five years from 1881 to 1885 alone more than *One Hundred Thousand* persons have been saved from dying of the disease, as is shown by the following Table.

TABLE showing the number of persons who have died of Consumption in England and Wales from 1858 to 1885 ; the number of those who would have died if the rate of Mortality had remained the same as it was in 1858; and on the other hand, the number of deaths there might have been if the death rate since 1858 had been no higher than it was in 1885.

CONSUMPTION.

	Actual Number of Deaths.	Would have died at 1858-60 rate.	Would have died at 1885 rate.
1858-60	151,615	151,615	103,615
1861-65	260,745	265,154	180,956
1866-70	268,680	282,160	193,088
1871-75	259,642	300,935	205,375
1876-80	255,517	321,822	219,629
1881-85	244,809	344,158	234,873
	1,441,008	1,665,844	1,137,536

Number of persons who *would have* died of Consumption from 1858 to 1885 at the death-rate of 1858	1,665,844
Number of those who *have* died in the same period	1,441,008
Number of those who *might* have died, but have *not*	224,836
Actual number who have died	1,441,008
Number of deaths there would have been if the death-rate of 1885 had begun in 1858	1,137,536
	303,472
Number of those who have *not* died, as given above	224,863
Number of those who *have* died, but *would not* have died if the death-rate existing in 1885 had prevailed from 1858	78,609

But, unfortunately, as a result of the unscientific use of my discovery, and of a disregard by many people of all the scientific conditions which I had carefully shown to be attached to its proper use, another disease, Cancer, is pushing on to take the place of Consumption, and more than *Seventy Thousand* persons have fallen victims to it who would have been spared if the death-rate from the disease had remained the same as in 1857.

TABLE showing the number of deaths from Cancer in England and Wales from 1858 to 1885, and the number of deaths there would have been if the death-rate had remained the same as it was at the beginning of that period.

CANCER.

	Actual Number of Deaths.	Would have died at 1858-60 rate.
1858-60	19,936	19,936
1861-65	38,190	34,819
1866-70	44,640	37,056
1871-75	52,564	39,521
1876-80	62,108	42,264
1881-85	72,971	45,198
	290,409	218,794

Number of people who have died of Cancer from 1858 to 1885 290,409

Number who would have died if the death-rate in 1858 had not risen 218,794

Number of those who *have* died, and *might not* 71,615

More than 33 per cent., being an increase of nearly *one-third.*

Effects such as those which I am considering, not confined to a limited number of instances, but affecting a large community, are influenced but slowly by personal action, whether individual or collective, so that their future progress may, to some extent, be foretold. It is, therefore, allowable to say that if the state of things at present existing in England continues to operate, as it has been doing for thirty years past, the same results will also continue to show themselves from year to year. In another thirty years (1917) the yearly mortality from Consumption will have fallen to 20,000 for an estimated population of 41 millions, while it now kills 48,000 in only 27 millions; but the annual mortality from Cancer at the same period will probably exceed 60,000, nearly ten times what it was sixty years before.

If the important office which you fill were invested with the faculties and powers which ought to belong to it, and with which, at some future day, it will certainly be endowed—if I could address you as the Minister of Public Health—if there were any chance of so weighty a question as this being investigated in a judicial spirit, free alike from the influences of professional jealousy and of the blind instincts of trade competition, I might venture to submit certain practical proposals which I conceive naturally flow from what precedes. But, in the present state of Public Opinion, there could, and there would, be no action in the matter. When I remember that it has taken thirty years to bring my discovery into general

use, and then only in its most unsatisfactory, its most unscientific, and its most inefficient manner, I could not hope to see any proposal such as I might make scientifically, that is, carefully and judiciously examined ; and at my time of life I feel it is my duty to go on with work which lies before me, rather than to take worry and give myself trouble about the fate of what I have already done. That, I know, will take care of itself, and may be left to those who come after me. Still, I believe that it was a duty incumbent upon me personally to speak out and to show how the evil in the state of things which I have shown in this letter, might have been avoided, and the good which has been done might have been made better still, and I have thought that you were the person to whom I could most naturally and legitimately address this public statement, because I flatter myself with the delusion, perhaps, that it may be of use to the public, and because all the facts above stated would have remained unnoticed and unheeded but for the publication of your yearly Reports. Individual experience might have noticed and called attention to the decline of Consumption, or to the increase of Cancer, but it would only have been an individual opinion, and as such unable to command general assent. Your Reports place the facts beyond the reach of controversy, and show the effects of causes which will continue to operate irrespective of individual opinion or of individual action. As was aptly said, many years ago, by a high authority

on the subject, "Censuses well made, and which succeed one another on a uniform plan, and at intervals sufficiently near, present the most precise notions of the physical and moral conditions of a people, and teach much better than voluminous inquiries, *which are often fettered by prejudice and private interests*, what we ought to think of the *retrograde state* (p. 7), *or the immoderate development of certain branches of Industry*" (p. 26).—(*Quetelet on Probabilities*, London, 1849).

Those among my professional colleagues who may have read my previous works will perhaps recollect what I stated many years ago, that "future progress in Medicine—and I purposely restrict that word to Pathology and Therapeutics—depends less upon the addition of new facts to the overwhelming number of those it already contains, than upon a minute study of those we know, and upon a strict application of the inductive method, so that in time, instead of being as now, the least inductive, Medicine will become the most inductive of all the sciences." Is it too much to say that this letter affords a proof of what may be done in that way?

When twenty-three years ago I said—

That Consumption was equal to *minus* phosphide element,

And that Cancer was equal to *plus* phosphide element,

if a series of experiments upon the Public Health had, by some individual will, been initiated and carried

out during the whole of the period which has elapsed since then, not within the lines I had laid down, not carefully, minutely, and scientifically, for the sake of benefiting mankind, but merely for the purpose of testing the validity of my statement, without any regard to consequences, without any care for the fate of individuals, and if these experiments had led to the changes in the General Mortality which I have discussed and explained in what precedes, would not these changes have been accepted as sufficient proof of the truth of what I had said? That which has not been done by some individual will, has been effected by the unconscious action of the community; but the cogency of the answer remains the same.

These facts, I think, should lead to two conclusions:

1. An appeal addressed to the Medical Profession. It now rests with the present generation to do what was not done thirty years ago by the last, to stamp out Consumption by treating every case in its earliest stage, and *from its very outset scientifically*, and not in the same haphazard way as it might be, by any layman or by any old woman. Let them vindicate at once both their privilege and their duty, by doing for Phthisis, though more definitely and accurately, what has been done in the past for Small Pox, for Scabies, for Syphilis, for Tropical Fever; what is now being done by an eminent Inventor, but an outsider, for Rabies. Let them show that the noble art they practise has reached a new position, that it really

possesses the power of arriving at definite ends by definite, scientifically ascertained, and scientifically controlled means, like the more advanced sciences of Physics and Chemistry.

2. The other conclusion applies to the Public, to whom it ought to show that the results of Medical Science do not always lie upon the surface, and that it may be a very grievous mistake for anyone to suppose that its means of action are things which may be handled or toyed with by whosoever pleases, merely because he cannot at once see the consequences to which they lead, and because they do not always immediately explode in his hands.

I remain, my dear SIR BRYDGES HENNIKER,

Yours very truly,

J. F. CHURCHILL, M.D.

6, *Bentinck Street, Manchester Square.*

P.S.—Your 49th Annual Report for 1886 has just been published. It confirms all that precedes.

The mortality from Cancer has again risen from 15,560 in 1885 to 16,243 in 1886. According to the death-rate in 1856, the number of deaths from Cancer in proportion to the population in 1886 ought only to have been 8,572; so that the mortality has been nearly double what it might have been, with a loss of 7,671 lives.

In 1886, 47,872 persons died of Consumption. According to the death-rate in 1856, the number in proportion to the population in 1886 would have been 71,646, so that in that one year there has been a saving of more than 23,000 lives.

APPENDIX.

The word Stœchiology, or Stœchiological Medicine, based upon the chemical researches of Liebig, Mülder, Lehmann, Liebreich, Robin, Verdeil, Owen Rees, Thudichum, and many others too numerous to mention here, is from the Greek word *stoicheion* (an element). Its fundamental principles were set forth by me for the first time thirty, and again a second time more fully twenty-three years ago. They may be summed up as follows:—

The Basis of Pathology.

All living beings are built up of certain elements which have been called proximate principles.

All disease is conditioned, or in other words depends upon, or is accompanied by changes, either in the quantity or quality of some one or more of these proximate principles.

A knowledge of these proximate principles, of their mode of origin, of the part they play in the living system, of the changes to which they are subject, of the means of promoting, of controlling, or of arresting such changes, embraces the whole field of medical science.

No one man, nor even several generations of men, can expect fully to work out such a subject, nor have I any pretension of the kind. If my doctrine be true it will take very many years, and very many

workers, before its scope is fully realized. Here I only wish to show the results I have myself already obtained, by two partial applications of the general principle.

The following are some of the main features of my doctrine of Stœchiological Therapeutics :—

The Basis of Therapeutics.

The elements of the system form a first class of natural remedies : such are Phosphorus, Soda, Potash, Lime, Iron, Chlorine, Sugar, Carbonate and Phosphate of Lime, &c., and the object of the physician is to ascertain the conditions of their existence and their mode of action in the system. These are Bromatological or Nutrimentary or Food Remedies.

A second class consists of substances which are not naturally elements in the system, but which, by virtue of their chemical properties, may for a time be partially substituted for one of the natural elements. These may be called Substitutive Remedies. To this second class may be referred such medicines as Iodine, Bromine, Manganese, Arsenic, Antimony, &c.

In a third class of toxical or Poisonous Remedies are included all those which are incapable of taking part in the vital actions, and which can only impair, arrest, or destroy the natural functions. This includes all poisons and the greater part of the drugs at present used in medicine. Some of these may perhaps in time take their place in the second, or

even the first class, but the greater part will probably be laid aside.

The Stœchiological Method.

My doctrine of Stœchiology differs from current and generally received opinions, not only as a new conception of disease and as a new classification of remedial agents, but likewise in its method and in its practical use of them. It holds that all remedial action is conditional, and that no substance can claim to be a *remedy*, until two kinds of facts concerning it have been fully ascertained by experiment or observation.

First, we require to know all the different phases and stages of its action on the system, and the different successive *physiogenic* and *pathogenic* effects it produces: the former term comprehending all normal phenomena, all increase or decrease of the functions within their normal limits; the latter comprising all manifestations of new or abnormal effects.

Second, when once these different *physiogenic* and *pathogenic* manifestations, produced in the system by any substance, have been recognized, determined, and classed in the order of their natural sequence, the next requirement is to find out to what phase or stage of this sequence the remedial or curative action of the remedy corresponds.

This supplies what has hitherto been altogether wanting in Medicine—a general principle which gives

the means of establishing, with regard to each substance, a scale to which the effects produced by its action may be referred, and their results accurately measured. Until this has been done for any one drug, its place in a true Therapeutical system is undetermined. It has, in reality, no scientific status, and should be looked upon merely as a possibility, requiring or deserving further investigation. The great majority of drugs at present in use are in this case.

This problem has been worked out by me for the Hypophosphites, and many years ago I published the results I had arrived at. I flattered myself that I had thus laid down clear and precise conditions of action, by means of which the physician, with proper care, might always produce constant and definite effects, liable to no other variation or uncertainty than what may always be expected in any long and complex scientific process. These facts have not met with the attention they required and which I think they deserve.

Neither has the example thus set with regard to the Hypophosphites been, so far as I am aware, followed for any other drug. For several years past medical activity has seldom been applied to the study and determination of the mode and conditions of action of any substance already known. It seems to be exclusively reserved for the transient, superficial, almost always insufficient and unscientific, consequently unsatisfactory trial of some new remedy, the fleeting fashion of the day, almost of the hour, which

comes and goes like a cloud across the sky, and the name of which is hardly learnt before it is discarded and forgotten for some newer one, as evanescent and as inefficient as itself.

I hold, however, that the principle which I have just explained, is a true, or rather the only true, and rational basis of Therapeutics, that is, of Medical Science. Through it we shall be able not only to say that a given remedy cures a given disease, but we shall be able to show the way in which it does it, because we shall know beforehand what are the signs we have to look for, as indicating the intermediate steps by which the final curative effect is to be reached, and what are the exact limits within which our Medicinal action is to be kept in order to attain that end. When the consequences and applications of this doctrine have been fully worked out, Therapeutics, that is, the science of curing disease, will become as consistent, as coherent as exact, and as certain a branch of knowledge as Physics or Chemistry.

REVIEWS AND OPINIONS

Concerning Dr. CHURCHILL'S Works and Discoveries.

"Of all the fearful scourges that afflict the human race, Consumption is at once the most widely spread and the most inexorable. It is always present in our midst, silently, stealthily, and surely marking out and striking down its victims. Perhaps the most terrible thing about Phthisis is its absolute hopelessness. Hitherto every known remedy has been tried against it, and all alike have failed. Within the last few years, however, public attention has been called in a very remarkable manner to cases in which the disease has been treated by the use of phosphorus, not in its native form—in which its energetic character makes it a most dangerous poison—but in the modified shape of the salts of hypophosphorus acid, first advocated by Dr. Churchill. It is impossible, in a question of such magnitude and importance as the discovery of a remedy for Phthisis, that the general public should not take a deep and most vital interest. It will certainly seem to any dispassionate member of the general public, as if a discussion of such vast and vital importance, in which the issues are merely matters of ordinary fact and observation, might perhaps, sooner have been brought to a satisfactory conclusion if the points in dispute had not been obscured by that professional jealousy which, it is to be feared, has only too often obstinately refused their due and deserved recognition to discoveries of the highest possible value to suffering humanity."—*Daily Telegraph*, June 16th, 1875.

"We have had opportunity of using the Soda Hypophosphite in many cases of chronic tubercular Phthisis, and have found the medicine a most valuable one; more generally useful than any other drug we have employed during the past ten years. In cases of consolidation of lung, of chronic kind, tending to induce tuberculosis, we have found the Hypophosphites unsurpassed. In some cases of this description in children, their effect is, as Dr. Eustace Smith says, in one of his lately published lectures in the *Medical Times and Gazette*, almost magical. When we see numerous physicians of repute and experience candidly admitting the valuable properties of the Hypophosphites as remedies in many forms of Phthisis and Tuberculosis, and when, too, we find these medicines placed among the additions to the British Pharmacopœia, we fail to see that Dr. Churchill has any hard treatment to complain of at the hands of the profession. That the introduction of these medicines has been a great gain to the better treatment of Consumption is a point we regard as fully established, and Dr. Churchill deserves well of mankind for what he has done."—*The Practitioner*, April, 1875.

"The reception of so important a discovery has not been encouraging. The Hypophosphites have been used not according to Dr. Churchill's rules, and he has then been blamed for the resulting failures! In other quarters his remedies have been used in secret, and the cures have been attributed to other causes. 'This,' says Dr. Churchill, 'is the last ordeal of the inventor before his apotheosis. Among artisans it is called *rattening;* in science it constitutes the well known process which the French call the conspiracy of silence.' What inventor or discoverer cannot confirm this from his own experience?"—*Chemical News*, April, 1875.

"It is not for us to say what is the value of these remedies. A wide and extending employment of them is an argument which possesses much force. Among English authorities not a few of the chief have found them of more or less service. The published opinions of a number of eminent foreign physicians show that many of them are warm believers in this system of treatment. Surely one might think the doctor ought to be satisfied with so much triumph in only seventeen years; but a half victory of this sort is by no means sufficient for him. Nothing less than the universal admission that he is the greatest benefactor of this or of any other age, for such he assuredly is if his claims are true, will content Dr. Churchill."—*Chemist and Druggist*, March, 1875.

"If we were asked whether we, judging from the 'standpoint' of the man of science, consider that Dr. Churchill's facts support his theory, we reply without hesitation in the affirmative. There are few scientific men, in the true sense of the word, who will be able to read this book without pleasure and profit, and without recognizing the profundity, the acuteness, and the originality of the author."—*The Quarterly Journal of Science*, July, 1875. (Edited by WILLIAM CROOKES, F.R.S.)

"Dr. Churchill declares pulmonary consumption can be successfully treated. This opinion is supported by physicians in all the principal cities of Europe, and copious extracts from their observations on the different cases are given, the cures always following closely upon the use of Hypophosphites by the sufferers. One has only to note the names of several well-known English Physicians who attest the value of this remedy, to be convinced that the discovery of Dr. Churchill is an immense benefit to the world. Such a great benefaction is not sufficiently acknowledged."—*The Echo*, February 12th, 1874.

"For several years we have watched the cases of a great number of patients who were under treatment by the Hypophosphites, particularly at the Dispensary Rue Larrey, established by Dr. Churchill in 1857.

Dr. Churchill's statement is, that Phthisis may be *always* cured *under certain conditions* which he has laid down with great rigour and accuracy. An assertion such as this requires complete and serious proof, and we think the reader will find it in the cases which occupy more than one-half of the work. We think it is impossible to institute a series of experiments more conscientiously and more rigorously carried out according to the requirements of legitimate science than that contained in the first half of this book."—*Gazette des Hopitaux*, Paris, Sept. 8, 1865.

"Dr. Churchill's clinical facts form a constant series of inductions, in which signs are always referred to their governing conditions, and results are made to constitute a science because they are continually traced back to the causes upon which they depend. It will be difficult to read, with an unprejudiced eye, the series of observations contained in the work before us without coming to the conclusion that the unknown condition to which Louis referred the few cases of spontaneous cure hitherto observed in Phthisis is now discovered, and may be reproduced at will."—*La France Medicale.*

"The Society sees that the results announced and obtained by Dr. Churchill go beyond anything which has hitherto been done in the treatment of this fatal disease."—*Report to the Brussels Royal Society of Medical Sciences* by Dr. BOUGARD, Vice-President, Feb. 6, 1865.

"After laying before the same Society reports of forty-two cases Dr. Tirifahy concluded as follows:—These facts establish the action of the Hypophosphite of Lime in Phthisis. One thing is evident: it has given me a number of cures such as no doubt every other mode of treatment will look upon with envy. I therefore advise the use of this remedy against pulmonary Tuberculosis *in all stages* of the complaint." —*Report* by Dr. TIRIFAHY *to the Brussels Royal Society of Medical Sciences*, August, 1865.

"In August, 1867, I was glad to verify by personal investigation at Dr. Churchill's Public Dispensary the reality of the facts he had published. I saw patients entirely cured, after having shown all the symptoms of the second and even of the last stage of Consumption."— *Dr. Fedeli, Chief Physician to the King of Italy*, "*Tratamento delle Malattie del Petto, Roma,*" 1875.

"I have been using the treatment discovered by Dr. Churchill for more than ten years, but have refrained from mentioning it until my opinion was completely settled. Whenever Consumption is not cured by the Hypophosphites, it is because the destruction of lung tissue already existing is of itself sufficient to produce death."—*Dr. Dehaut* "*Manuel de Médecine*," 16th Edition, Paris, 1884.

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